

CLAIMS

1. Manufacturing method of an electronic module including at least one insulating sheet on each of its faces and at least one element having a levelled face on the exterior surface of the module, comprising the following steps:
 - placing a first insulating sheet on a work surface, said sheet includes at least one window in which an element will be housed,
 - inserting the element in the window of the insulating sheet,
 - stacking a protection film extending over a region covering at least the outline of the window, said protection film is coated or made up of an adhesive substance active either at room temperature, or activated under the effect of heat and/or pressure, said protection film is called adhesive film,
 - laminating the assembly previously formed.
 - stacking then laminating a second insulating sheet on the assembly formed by the first insulating sheet, the element and the protection film, said second insulating sheet constituting the second face of the module.
2. Method according to claim 1 wherein the outline of the window of the insulating sheet adapts to the outline of the element.
3. Manufacturing method of a module according to claim 1, wherein the element is thicker than a first insulating sheet and housed in the window, and several insulating sheets are stacked, with the outlines of the windows of each sheet coinciding, and the total thickness of the stack being approximately the same as that of the element housed in the windows of each sheet, the adhesive film being placed on the stack by covering at least the outline of the window of the last sheet of the stack.
4. Manufacturing method of a module according to claim 1, wherein the element is thicker than a first insulating sheet and housed in the window, and the adhesive film is placed on the element in such a way as to also extend over the outline of the window of said first sheet, the supplementary sheets each provided with a window are stacked, the outline of the windows of each sheet coinciding with the outline of

the window of the first sheet, and the thickness of the assembly of sheets is approximately the same as the thickness of the element.

5. Method according to anyone of the claim 3 or 4, wherein a second insulating sheet is stacked then laminated onto the assembly formed by the first sheet(s), the element and the protection film, said second insulating sheet constituting the second face of the module.

6. Method according to claim 1, wherein the element inserted in the window of the insulating sheet is made up of an electronic component.

7. Method according to claim 1, wherein the element inserted in the window of the insulating sheet is constituted by an inert core to be removed at the end of the module manufacturing process, leaving a cavity having the form of the core previously inserted on one of the faces of said module, said cavity being used for the subsequent insertion of an electronic component.

8. Module manufacturing method according to claim 6, wherein the element has a first face that levels the exterior surface of the module, and a second face presenting the conductive areas for connection, the module furthermore including an electronic circuit, comprising the following supplementary steps that are carried out after the stacking of the protection film:

- placing the electronic circuit in an area near the window containing the element,
- connecting the connection areas of the element to the electronic circuit,
- distributing a layer of filling material over the protection film, over the insulating sheet and over the electronic circuit,
- stacking a second insulating sheet on the layer of filling material,
- laminating the previously formed assembly.

9. Module manufacturing method according to claim 7, said module including an electronic circuit, comprising the following supplementary steps that are carried out after the stacking of the protection film:

- placing the electronic circuit in an area near the window containing the element,
- distributing a layer of filling material over the protection film, over the insulating sheet and over the electronic circuit,
- stacking a second insulating sheet on the layer of filling material,
- laminating the previously formed assembly.

10. Method according to claim 9, wherein, prior to the distribution of the filling material layer, conductive connection areas are placed on the interior face of the element opposite the face that levels the exterior surface of the module, said connection areas are then connected to the electronic circuit.

11. Method according to claim 9, wherein the electronic circuit includes connections ending on the interior face of the element opposite the face that levels the exterior surface of the module.

12. Method according to anyone of the claim 8 or 9, wherein, prior to the application of the protection film on the insulating sheet and element assembly, the electronic circuit is placed on said protection film and the protection film and electronic circuit assembly is applied onto the insulating sheet and element assembly.

13. Method according to claim 8 wherein the protection film includes at least one window situated opposite the connection areas of the element.

14. Method according to claim 8, wherein the first insulating sheet includes a cavity, the outline of said cavity being adapted to the outline of the electronic circuit which will be placed in said cavity.

15. Electronic module including an assembly of two insulating sheets and an element, a first insulating sheet constituting one of the faces of the module including at least one window in which the element is housed, one face of said element levelling the surface of said first sheet and appearing on the exterior face of the module, and the second insulating sheet constituting the other face of the module, wherein an adhesive film, which extends over a region covering at least the outline of

the window of the element and is located in a region between the first sheet and the second sheet.

16. Electronic module according to claim 15, including at least one electronic circuit placed between both insulating sheets and is connected to the element on the connection conduction areas situated on the interior face of the element.

17. Electronic module according to claim 15, wherein the adhesive film includes a window opposite the conductive connection areas of the element, the outline of said window being adapted to the outline of the zone occupied by said connection areas.

18. Electronic module according to claim 16, wherein a layer of filling material extends between both insulating sheets and covers all or part of the adhesive film and the electronic circuit.

19. Electronic module according to claim 15, wherein the exterior faces of the insulating sheets constituting the exterior module faces include a decoration or a marking.

20. Electronic module according to claim 15, wherein the element is constituted by an inert core to be removed leaving a cavity taking the form of the previously inserted core, on one of the faces of said module, said cavity to be used for the subsequent insertion of a fixed or removable electronic component.

21. Electronic module according to claim 20, wherein the bottom of the resultant cavity, after the element has been removed, includes conductive contact areas connected to the electronic circuit.

22. Electronic module according to claim 15, wherein the element is constituted by an electronic component.